

**PATENT** 

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants

Brian Philip Allen et al.

Int'l Application No.:

PCT/GB2003/002756

U.S. Application No.:

10/519,518

Int'l Filing Date

June 27, 2003

Title

ELECTROCHEMICAL SENSING USING AN ENZYME

**ELECTRODE** 

Docket No.

: 310134.401USPC

Date

: July 18, 2005

Mail Stop PCT Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

## **INFORMATION DISCLOSURE STATEMENT**

## Commissioner for Patents:

In accordance with 37 CFR 1.56 and 1.97 through 1.98, applicants wish to make known to the U.S. Patent and Trademark Office the references set forth on the attached Form PTO-1449. Copies of the cited U.S. patents and published patent applications are not required and accordingly have not been provided. Copies of all other cited references are enclosed. As to any reference cited, applicants do not admit that it is "prior art" under 35 U.S.C. §§ 102 or 103, and specifically reserve the right to traverse or antedate any such reference, as by a showing under 37 CFR 1.131 or other method. Although the aforesaid references are made known to the Patent and Trademark Office in compliance with applicants' duty to disclose all information they are aware of which is believed relevant to the examination of the above-identified application, applicants believe that their invention is patentable.

Please acknowledge receipt of this Information Disclosure Statement and kindly make the cited references of record in the above-identified application.

Applicants believe this Information Disclosure Statement has been timely filed, however, the Director is authorized to charge any fee due by way of this Information Disclosure Statement to our Deposit Account No. 19-1090.

Respectfully submitted,
Seed Intellectual Property Law Group PLLC

Stephen J. Rosenman, Ph.D. Registration No. 43,058

Enclosures:

Postcard Form PTO-1449 Cited References (22)

701 Fifth Avenue, Suite 6300 Seattle, Washington 98104-7092

Phone: (206) 622-4900 Fax: (206) 682-6031

609221

BS MAIL NO. EV335614529US Sheet 1 of 2 FORM PTO-1449 ATTY, DOCKET NO. APPLICATION NO. U.S. DEPARTMENT OF COMMERCE (REV.7-80) PATENT AND TRADEMARK OFFICE 310134.401USPC 10/519,518 APPLICANTS Brian Philip Allen et al. INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary) INT'L FILING DATE **GROUP ART UNIT** June 27, 2003 U.S. PATENT DOCUMENTS \*EXAMINER FILING DATE DOCUMENT NUMBER DATE CLASS SUBCLASS NAME INITIAL IF APPROPRIATE 4,595,479 06/17/86 204 294 Kimura et al. 204 4,704,193 11/03/87 Bowers et al. 1 T AB 25 6,492,132 12/10/02 435 Roberts et al. **FOREIGN PATENT DOCUMENTS** TRANSLATION DOCUMENT NUMBER DATE COUNTRY YES 0 184 909 A2 06/18/86 EP AD 2 313 912 A 12/10/97 GB AE WO 00/22158 WIPO 04/20/00 AF 199 57 826 C1 06/21/01 DE (+ Abstract in English) AG 1 199 560 A1 04/24/02 EP (+ Abstract in English) ΑH 2 391 945 A 02/18/04 **GB** ΑI OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.) Allen, P., et al., "Surface Modifiers for the Promotion of Direct Electrochemistry of Cytochrome," J. Electroanal. Chem., 178:69-86, 1984. Chaubey, A., et al., "Mediated Biosensors," Biosensors & Bioelectronics, 17(6-7):441-56, ΑK June 2002. Estabrook, R., et al., "The Use of Electrochemistry for the Synthesis of 17 Alpha-AL Hydroxyprogesterone by a Fusion Protein Containing P450c17," Endocr Res. 22(4):665-71, November 1996. Habermüller, K., et al., "Electron-transfer Mechanisms in Amperometric Biosensors," AM Fresenius J Anal Chem., 366(6-7):560-8, March-April 2000.

| Reductase, an Iron-Sulfur Flavoprotein," J. Am. Chem. Soc. 119:11628-11638, 1997.

EXAMINER | DATE CONSIDERED

\* EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant(s).

Blackwell Academic Press, London, 1994, pp. 356-373.

Christensen & Hamnett, Techniques and Mechanisms in Electrochemistry of Cytochrome,

Heering, H., et al., "Direct Detection and Measurement of Electron Relays in a

Multicentered Enyme: Voltammetry of Electrode-Surface Films of E. coli Fumarate

AN

AO

FORM PTO-1449 ATTY, DOCKET NO. APPLICATION NO. U.S. DEPARTMENT OF COMMERCE (REV.7-80) PATENT AND TRADEMARK OFFICE 310134.401USPC 10/519,518 APPLICANTS Brian Philip Allen et al. INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary) INT'L FILING DATE GROUP ART UNIT June 27, 2003 **U.S. PATENT DOCUMENTS** \*EXAMINER FILING DATE DOCUMENT NUMBER SUBCLASS NAME CLASS INITIAL IF APPROPRIATE BA FOREIGN PATENT DOCUMENTS TRANSLATION DOCUMENT DATE COUNTRY NUMBER YES BB OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.) Iwuoha, E., et al., "Drug Metabolism Biosensors: Electrochemical Reactivities of вС Cytochrome P450cam Immobilised in Synthetic Vesicular Systems," J. Pharm. Biomed. Anal., 17(6-7):1101-10, September 1, 1998. Joseph, S., et al., "An Amperometric Biosensor with Human CYP3A4 as a Novel Drug BD Screening Tool," *Biochem. Pharmacol.*, 65(11):1817-26, June 1, 2003. Kazlauskaite, J., et al., "Direct Electrochemistry of Cytochrome P450cam," Chem. BE Commun., pp. 2189-2190, 1996. Murray, R., "Chemically Modified Electrodes," Acc. Chem. Res., 13:135-141, 1980. BF Reipa, V., et al., "A Direct Electrode-Driven P450 Cycle for Biocatalysis," Proc. Natl. BG Acad. Sci. USA, 94:13554-13558, December 1997. Schuhmann, W., "Amperometric Enzyme Biosensors Based on Optimised Electron-transfer BH Pathways and Non-manual Immobilisation Procedures," J Biotechnol., 82(4):425-41, February 2002. Sugihara, N., et al., "Immobilization of Cytochrome P-450 and Electrochemical Control of ΒI its Activity," Polym. Adv. Technol., 9:307-313, 1998. Vilker, V., et al., Redox Chemistry and Interfacial Behaviour of Biological Molecules, BJ Plenum Press, New York, 1987, "Bacterial Cytochrome P-450 Enzymes and Reactions on Immobilized Electrodes," pp. 105-112. Vilker, V., et al., "Synthesis of Oxygenated Hydrocarbons by Cytochrome P450 BK Electroenzymology," Electrochemical Society Proceedings, 97-6:91-99, 1997. Zhang, Z., et al., "Direct Electron Injection from Electrodes to Cytochrome P450<sub>cam</sub> in Biomembrane-like Films," J. Chem. Soc., 93(9):1769-1774, May 7,1997. **EXAMINER DATE CONSIDERED** 

Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in

conformance and not considered. Include copy of this form with next communication to applicant(s).